deposits in order to initiate service if the subscriber voluntarily elects to receive toll blocking (par. 389). Both of these are applied symmetrically to all providers of Lifeline services.

In the case of prohibiting disconnection of local service for nonpayment of toll, a long term sustainability problem may occur. A sustainability problem would be created if the costs to carriers of not being able to disconnect service, such as uncollectibles or bad debt, are large enough to threaten the financial ability of the carriers to continue providing universal service to customers. There are various ways to remedy this problem. One is to simply remove the prohibition, but that may not result in sufficient numbers of low income customers remaining on the network. A second remedy is to allow carriers to require customers to select toll blocking in order to prevent disconnection. This would limit the scope of possible new, perhaps uncollectible, debt by such customers to non-toll services, which is usually much smaller than for toll services. A third remedy is to compensate providers for the uncollectibles they incur from such customers from the universal fund. The second remedy would effectively create a revised unilateral rule, whereas the third remedy would convert the unilateral rule to a bilateral agreement.

Like disconnection, security deposits can be used as a means of mitigating losses from uncollectibles. The proposed rule to prohibit security deposits is also likely to be sustainable so long as uncollectibles from Lifeline customers (who voluntarily elect toll blocking) for non-toll services are not large enough to threaten the financial ability of the carrier to continue providing universal service to customers. The remedy for this problem, if the collectibles are large, is to convert the unilateral rule to a bilateral one by providing compensation to carriers for such uncollectibles from the universal service fund.[27]

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[27] It is important to note, however, that if uncollectibles for non-toll services is too large, then the second remedy described above for addressing the prohibition on disconnection of local service for non-payment of

TABLE 7

Analysis of Low Income Customer Rules

Recommendation	Unilateral v. Bilateral Rule	Is Rule Sustainable?	Possible Remedy
• Carriers provide Lifeline and Linkup programs for which they are compensated (pars. 416-429).	• Bilateral agreement.	• Yes, so long as amount of compensation is sufficient.	
• Carriers provide voluntary toll limitation at no charge but receive reimbursement for incremental costs (par. 385).	• Bilateral agreement.	• Yes.	
• No disconnection of local service for non-payment of toll charges allowed for Lifeline customers (par. 387)	• Symmetric unilateral rule.	• Yes, unless uncollectibles become too large.	• If uncollectibles are too large: (1) revoke the prohibition; or (2) allow carriers to require customers to select toll blocking to prevent disconnection; or (3) compensate carriers for uncollectibles.
• No service deposits may be required of Lifeline customers if the subscriber volutarily elects toll blocking (par. 389).	• Symmetric unilateral rule.	• Yes, unless uncollectibles become too large.	• If collectibles are too large, convert the unilateral to a bilateral agreement by compensating carriers for uncollectibles.

toll will not cure the sustainabillity problem. Rather, the third remedy, as with the remedy proposed for the prohibition on security deposits, must be used.

C. Rules for Services to Educational Institutions and Libraries

Section 254(h)(1)(B) of TA96 requires that telecommunications carriers provide telecommunications services, considered to be within the definition of universal service, at a discount to certain educational institutions and libraries. Sections 254(h)(1)(B)(i) and (ii) also provide that telecommunications carriers are to be compensated in an amount equal to the amount of the discount, either by an offset to contributions they would otherwise owe to universal service support mechanisms or by direct reimbursement from such support mechanisms. Thus, by law, Congress has required discounts by carriers as part of a bilateral agreement.

The Joint Board has recommended several rules for purposes of implementing such a bilateral agreement. Several aspects of these rules will be reviewed for their sustainability properties. The results are summarized in Table 8.

First, the Joint Board interprets section 254(h)(1)(B) to mean that carriers must be permitted to choose either reimbursement or offset for purposes of being compensated in exchange for providing discounts (par. 613). So long as the methodology for calculating the amount of compensation, whether for reimbursement or offset, is sufficient to recover the true difference in rates charged to educational institutions and libraries as opposed to similarly situated parties for similar services, generally this bilateral agreement should be sustainable. This is particularly true since carriers have the reimbursement option. Problems with providing only an offset option will be discussed in the next section where rules related to health care providers are analyzed.

However, notwithstanding the preceding, there are circumstances under which the bilateral agreement may not be sustainable. This could occur if there are services, for which reimbursements or offsets are provided, that are subject to a universal service levy for some but not all entities that are eligible for the compensation. The result would be a disparate levy burden among providers providing discounts for such services to eligible educational institutions and libraries. These circumstances are likely to occur if both carriers and non-carriers are eligible for reimbursement for discounts, and the levy is then assessed only on the services provided by the carriers.

This scenario may occur as a result of the Joint Board's recommendations as to the scope of services to be provided to educational institutions at a discount. In particular, the Joint Board recommends that discounts be provided not only for all telecommunications services (par. 460), but also for Internet access (pars. 462-465) and internal connections (pars. 473-484). In this regard, Internet access includes basic conduit from the school or library to the backbone Internet network, the communications link to information service providers (ISP's), the subscription fee paid to ISP's, and electronic mail (par. 463). In addition, internal connections include the installation and maintenance of inside wire (par. 474), as well as routers, hubs, network file servers, and wireless local area networks, but not personal computers (par. 476).

There are many entities, both telecommunications carriers and non-carriers, that provide Internet access and internal connections as defined by the Joint Board. If both telecommunications carriers and non-carriers provide such services or capabilities to schools and libraries at a reimbursable discount, it is possible that those entities will be subject to different levy burdens if the services or capabilities provided only by the carriers are subject to the universal service levy. The result will be lack of competitive neutrality of the levy. The remedy would be to either eliminate the levy on carriers as to those services and capabilities, or to impose the same levy on the services and capabilities of the non-carriers.

TABLE 8

Analysis of Rules for Service to Educational Institutions and Libraries

Recommendation	Unilateral v. Bilateral Rule	Is Rule Sustainable?	Possible Remedy
• Carriers receive compensation, their choice of reimbursements or offsets, for providing discounts to schools and libraries (par. 613).	• Bilateral agreement.	• Yes, so long as amount of reimbursement is sufficient.	
• Telecommunications services, Internet access, and internal connections are to be provided at a discount for which the providers are compensated (pars. 460-484).	• Bilateral agreement	• Yes, but is not competitively neutral so long as any reimbursable service or capability which is subject to a universal service levy for an eligible provider is subject to the levy for all eligible providers.	• Ensure that the same universal service levy applies to all or none of the eligible providers of a reimbursable service or capability.

D. Rules for Services to Health Care Providers

In section 254(h)(1)(A), Congress requires telecommunications carriers to provide telecommunications services necessary for the provision of health care services in a State to any public or nonprofit health care provider (HCP) that serves persons who reside in rural areas in that State at rates that are reasonably comparable to rates charged for similar services in urban areas in that State. As to this section, the Joint Board recommends that the FCC seek additional information regarding the telecommunications needs of HCP's and the costs of providing such services before adopting any final rules (par. 631). Nonetheless, the Joint Board did make some recommendations for implementing section 254(h)(1)(A), which we consider here.

Although not expressly provided by Congress in TA96, the Joint Board recommends that carriers be compensated for the difference between the urban and rural rates (as defined elsewhere in the recommendations) (par. 716). In so doing, the Joint Board is converting Congress' unilateral rule to a bilateral agreement. If provision of services to eligible HCP's at urban rates is non-compensatory, then this conversion to a bilateral rule is necessary for long term sustainability purposes.

However, the Joint Board also proposes that the compensation to carriers be provided only in the form of an offset towards their universal service support obligations, not direct reimbursements from universal service funds (par. 716). By permitting offsets but no reimbursements, the Joint Board creates an asymmetric impact between carriers that are net payors and those that are net recipients of federal universal service funds. Net recipients would effectively receive their compensation, if ever, at a later time because offsets would need to be carried over to subsequent years. This disparate impact will create a long run sustainability problem if there are carriers that tend to perpetually be net recipients — which is likely, for example, for smaller local exchange providers. One remedy for this sustainability problem is to simply permit reimbursements, not just offsets.

The Joint Board, however, also recommends a mechanism by which carriers could provide services to HCP's at cost-based rates, other than the required urban rate, under certain circumstances (par. 681). Such circumstances include "if the carrier deems the method [for determining the rate that the carrier must offer] ... would be ... unfair for any reason"(par. 681). Thus, another remedy to the above sustainability problem is to apply par. 681 to allow carriers to charge eligible HCP's cost-based rates if such carriers would otherwise be adversely affected as a result of being perpetual net recipients of universal service support.

TABLE 9
Analysis of Rules for Service to Health Care Providers

Recommendation	Unilateral v. Bilateral Rule	Is Rule Sustainable?	Possible Remedy
• Carriers provide telecommunications services to HCP's serving rural areas at urban rates, for which offsets are given against carriers" universal service obligations .	• Bilateral agreement.	• Could create asymmetric impact on net payors and net recipients of federal universal service funds	• Allow compensation in the form of reimbursements, or apply par. 681 of the Jt. Bd. recommendations to allow carriers who are perpetual net recipients to charge cost-based rates.

E. Rules for Carrier of Last Resort Obligations and Eligible Carriers

As with low income consumers, under section 254(b)(3), Congress also established as a universal service principle that consumers in rural, insular, and high cost areas should have access to telecommunications and information services that are reasonably available, and at rates that are reasonably comparable to, those provided in urban areas. The imposition of COLR obligations is a tool which has been used historically to ensure that all customers receive telecommunications services. Its imposition has been particularly critical for ensuring provision of service in rural, insular, and high cost areas.

Under section 214, Congress has also provided a definition for "eligible carrier," that is, those carriers which are to be eligible to receive any universal support funds in accordance with section 254. The Joint Board recommends that this definition of eligible carrier be interpreted so that carriers are not required to take on COLR obligations in order to be eligible for universal service support. Yet, the Joint Board also recommends that only ILEC's be required to bear COLR obligations. We show that these recommendations embody unsustainable rules, which are likely to adversely affect continued provision of universal service to customers, particularly those living in rural, insular, and high cost areas. A summary of our analysis is provided in Table 10.

By imposing COLR obligations only on ILEC's and not including them as part of the obligations of an eligible carrier (pars. 156-157), the Joint Board proposes that COLR obligations be fulfilled through asymmetric imposition of a unilateral rule. As described in section III, such a unilateral rule is unsustainable, not only because it is asymmetrically applied but because COLR obligations are not sustainable as unilateral rules in a competitive environment. As we show, this rule is unsustainable not only in the long run but for the transition to competitive local exchange markets.

As to long run sustainability regardless of preexisting investments by carriers, the Joint Board fails to provide compensation to ILEC's for the costs of complying with their COLR obligations that will be incurred in the future. This failure arises because the Joint Board: (1) fails, at least for purposes of serving high cost areas, to include COLR obligations as obligations of a carrier eligible for universal service support pursuant to section 214 of the TA96, and, therefore, bases the amount of compensation to be paid to eligible carriers on obligations that do not include COLR obligations; and (2) requires that all eligible carriers be paid the same amount of compensation in a given serving area.

As a result, no compensation will be provided to ILEC's for the additional costs and financial risks associated with fulfilling their future (ongoing) COLR obligations.

This long run sustainability problem is due in part to the fact that the cost methodology for determining universal service support in high cost areas is to be based on hypothetical forward-looking, not actual, costs to be estimated by some proxy cost model yet to be determined (pars. 268-270). Furthermore, the proxy cost models explored to date do not recognize the costs and financial risks associated with COLR status. This sustainability problem is not as imminent for rural ILEC's as for non-rural ILEC's, because rural ILEC's are permitted to recover their embedded costs as well as other sources of existing universal service support (such as DEM weighting and Long Term Support) during a period of three to seven years before a transition to use of a proxy model (pars. 271-272). (Note, however, that this recovery is capped at 1996 levels.) In addition, state commissions are not required to designate more than one eligible carrier in areas served by rural carriers. The problem is immediate for non-rural ILECs.

The integrity of the transitional plan is also jeopardized by the fact that the Joint Board fails to provide compensation to non-rural ILEC's for the unrecovered costs arising from prior investments to fulfill their past (and continuing) COLR obligations. Rural ILEC's are permitted to recover their embedded costs at frozen recovery levels on an interim basis. Therefore, the transitional sustainability problem is also most immediate in non-rural areas. Such failure to adequately compensate for the unrecovered preexisting investments poses a confiscation problem under the Takings and Due Process Clauses. Thus, this sustainability problem needs to be addressed, not only for purposes of creating sustainable present universal service policies but, to ensure the credibility of future bilateral commitments made by the FCC and state commissions, which is the underlying function served by these Constitutional Clauses.

The preceding long term and transitional sustainability problems associated with COLR obligations can be addressed in several ways. We will consider these problems separately.

For long term sustainability regardless of preexisting investments, one remedy is to simply eliminate the COLR requirements prospectively. This remedy might prove to be politically unacceptable, however, in that some customers may be without some services in some serving areas for significant periods of time.

If the COLR obligations are not to be eliminated, then the remedy must consist of imposition of the obligations as part of an appropriate bilateral rule. A bilateral commitment would be required where the vulnerability to expropriation of investment by allowing entry (by those not bearing COLR obligations) is large, whereas a bilateral agreement would suffice where such vulnerability is small.

If a bilateral commitment is required, it still need not be structured as was done traditionally through the grant of a monopoly franchise. This is because, in some serving areas, a competitive environment may sustain more than one facilities-based COLR where demand exceeds minimum efficient scale of production. Therefore, a bilateral commitment should permit the possibility of multiple COLR's in a given serving area. On the other hand, demand and supply characteristics may be such that the market may sustain only one facilities-based COLR. Under such circumstances, more than one COLR should not be required.

Therefore, generally, a bilateral commitment should permit, but not mandate, either one or more than one COLR for a given serving area. In addition, regardless of the number of COLR's that ultimately serve an area, the bilateral commitment can provide for competition ex ante to determine the COLR('s) even though entry would be barred ex post to non-COLR's (for some specified period of time). Such competition ex ante could be performed by some form of competitive bidding mechanism.

We also note that it may be possible to avoid use of a bilateral commitment, instead of a bilateral agreement, if the vulnerability to expropriation of investment can be sufficiently lowered by allowing a different form of technology to be utilized by a carrier in fulfilling its COLR obligations. This might be achieved, for example, by permitting carriers to fulfill their COLR obligations on a wireless rather than a wireline basis.

If a bilateral agreement can be used, then it also needs to be structured properly. At a minimum, compensation must be provided to carriers for the additional costs incurred in complying with their COLR obligations. But, at this time, it is not clear whether the COLR requirements and the requirements of an eligible carrier under section 214 must be combined as part of the same bilateral agreement for long term sustainability purposes. Such a determination requires further research and analysis.

For transitional sustainability arising from preexisting investments, compensation must be provided to carriers for the remaining, unrecovered costs incurred by prior investments to fulfill their past COLR obligations. This is required by constitutional principles, whether viewed as necessary to avoid a confiscation under the Takings and Due Process Clauses, to enforce contracts consistent with the principles of the Contract Clause, or to prevent the trapping of costs caused by conflicting rules between governmental bodies as exemplified by the principles of the Supremacy Clause. Again, such compensation is necessary not only to enable carriers to maintain their compliance with COLR obligations in the short run but to ensure sustainable bilateral commitments (i.e. through credible commitments by governmental bodies) in the future.

TABLE 10

Analysis of Carrier of Last Resort Obligations and Eligible Carriers

Recommendation	Unilateral v. Bilateral Rule	Is Rule Sustainable?	Possible Remedy
• COLR obligations are imposed only on ILEC's.	• Asymmetric unilateral rule.	• No, bilateral rules are required for costs associated with both past and future COLR obligations.	• (1) For future COLR obligations: eliminate the COLR requirements; create a bilateral commitment if vulnerability to expropriation of investment is large; or create a bilateral agreement if vulnerability to expropriation of investment is small. (2) For past COLR obligations, provide compensation for unrecovered costs of prior investments.

V. Summary and Conclusion

New technologies and increasing competition are rapidly dismantling the monopoly provision of telecommunications services in the U.S. Many of the performance obligations once carried out as part of a bilateral commitment between service providers and governments are now being administered as unilateral rules. Yet, existing unilateral rules are fundamentally incompatible with a competitive telecommunications industry because: (1) they are applied differently to different firms; (2) firms have differential abilities and incentives to evade the rules due to difficulties in monitoring compliance; and/or (3) the investments required to satisfy the rules are sufficiently at risk to expropriation to preclude provision of service at desired levels of quality, continuity and price. For long term sustainability, the solution for the first problem is to apply unilateral rules symmetrically, for the second problem to convert unilateral rules to bilateral agreements, and for the third problem to convert unilateral rules to bilateral commitments.

To manage the transition to a more competitive regime, governments need to recognize the existence of bilateral commitments and be willing to renegotiate them as needed. Furthermore, the scope of governmental liability should be broadened so that governments compensate firms for abrogating the terms of existing bilateral commitments. This liability should be based on more expansive application of traditional, constitutional legal principles, relating to sustainability problems arising from preexisting investment, which underlie the Takings, Due Process, and Supremacy Clauses of the U.S. Constitution. In this regard, governments need to anticipate new confiscation problems and new types of conflicts among rules of differing governments. In this way, policymakers will better address the financial effects of changes in regulatory rules on formerly monopoly providers and better position themselves to forge new bilateral commitments in the future.

In some cases, Congress, under the Telecommunications Act of 1996, and the Federal-State Joint Board on Universal Service, pursuant to its recommendations in Docket No. 96-45, have appropriately structured unilateral rules and bilateral agreements. Imposition of a levy on <u>all</u> telecommunications carriers, broadly defined, to fund universal service support is an example of an appropriate, symmetrically applied unilateral rule. Unfortunately, further aspects of implementing this levy, particularly the existence of other federal and state rules which effectively create differential abilities between carriers for passing through the levy to customers, pose sustainability problems and require modifications. The basic compensation arrangements to carriers for Lifeline and Linkup programs and reimbursements to carriers for discounts provided to schools and libraries are examples of appropriate bilateral agreements. However, other aspects of the Joint Board recommendations for implementing universal service support for low income customers and for schools and libraries also require modifications to ensure sustainability and competitive neutrality.

Among the most problematic Joint Board recommendations are their treatment of carrier of last resort obligations. In this regard, the Joint Board proposes rules that would undermine the long term sustainability of universal service policy and the integrity of the transition process. Remedies for these problems would require either the elimination of carrier of last resort obligations altogether or the creation of appropriate bilateral rules.

In order to maintain carrier of last resort obligations on a prospective basis, it is imperative for legislators and regulators to recognize that, so long as vulnerability to expropriation of investment remains large, bilateral commitments are a necessity. In this context, some entry barriers may still be required, although not necessarily in the form of a monopoly. To avoid this result, policymakers should permit carriers to take actions to reduce their vulnerability to expropriation of investment, such as by permitting carriers to use alternative (e.g. wireless) technologies, to satisfy their carrier of last resort obligations. Equally important, policymakers and regulators must understand that, for both transitional and long term sustainability reasons, carriers must also be compensated for unrecovered costs associated with prior investments arising from past carrier of last resort obligations.